CHAPTER 3

DETERMINATION OF CAPACITY REQUIREMENTS

3-1. Total storage requirements. The amount of water storage provided will conform to the requirements set forth herein.

a. All Army installations. In general, total storage capacity, including elevated and ground storage, will be provided in an amount not less than the greatest of the following items:

- Item 1: Fifty percent of the average total daily domestic requirements plus all industrial requirements. This will provide minimum operational storage needed to balance average daily peak demands on the system and to provide an emergency supply to accommodate essential water needs during minor supply outages of up to 1-day duration. For the purposes of this item, essential water needs do not include the fire demand.

- Item 2: The fire demand. The fire demand is the required flow needed to fight a fire in the facility (including water required to support fire suppression systems) which constitutes the largest requirement for any facility served by the water supply system, plus 50 percent of the average domestic demand rate plus any industrial requirement. This amount will be reduced by the amount of water available under emergency conditions during the period of the fire. The fire demand quantity must be maintained in storage for fire protection at all times except following a fire fighting operation when the fire demand quantity would be depleted. It is recognized that during daily periods of peak consumption due to seasonal demands, the amount of water in storage will be less than full storage capacity; however, conservation methods will be instituted to prevent drawdown of water in storage below the fire demand quantity. Particular attention must be paid to water usage for uncontrolled irrigation.

- Item 3: The sum of Item 1 and 2 above, that is, the sum of 50 percent of the average total daily domestic requirements, all industrial requirements for an average day which cannot be shut off during emergency conditions, and the required fire demand. The sum of the above items will be reduced by the amount of water available in 24 hours under emergency conditions. This will provide maximum storage where emergency water supply is a minimum over a 24-hour period or a supply main outage would significantly affect overall supply conditions.

b. Amount of water available under emergency conditions.

(1) The amount of water available under emergency conditions is considered to be that available from auxiliary powered pumps during electric power outage, from electric-motor driven pumps with the largest pump out of service, from one or more supply mains with the main of greatest capacity out of service, or from the water treatment plant with one filter out of service. Normally, the capacity of the clearwell storage at the treatment plant will not be considered part of the required storage.

(2) Where the water supply is obtained from wells, all of which are equipped with standby power and located within the distribution systems, the emergency supply will be considered as the quantity available from all but one of the wells. Where one well has a capacity greater than the others, that one will be assumed out of service. Where only 50 percent of the wells have standby power, the emergency supply will be considered as the quantity available from the wells having standby power.

(3) Where the project is supplied from a dependable existing source, such as a municipal system with adequate storage and standby facilities, through supply lines not subject to damage by floods, high pressure, or other unusual conditions, the amount of water available under emergency conditions is that obtainable with the largest connection inoperative.

(4) Where the supply is delivered through a single supply main, the maximum amount of storage as determined in paragraph 3-1.a. will be provided.

(5) Where the peak demand for water is available at adequate residual pressure through two or more lines while the line having the greatest capacity is out of service, no storage will be required.

(6) Where the peak demand for water is available through two or more lines but is not available if the line having the greatest capacity is out of service, storage will be required. The quantity of water available under emergency conditions with the line of greatest capacity out of service will be considered in calculating the amount of storage required.

3-2. Elevated storage capacity. The total elevated storage capacity at all Army installations, except plant and special projects, should not be less than the amount determined in paragraph 3-1.a. Item 2, nor less than 50 percent of the total required storage, unless special conditions prevail which would negate the need for such storage. For projects with design populations of 10,000 or less, consideration will be given to providing all elevated storage where the storage will result in an economical and reliable system. For projects such as storage depots or aircraft hangars with deluge sprinkler systems, ground storage reservoirs with booster pumps will generally be the more

economical method of supplying large volumes of water for fire protection. Elevated tanks will normally be provided for initial sprinkler demand in storage warehouses.